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the middle of the wings a common white band, commencing on the costa of primaries, with a large spot cut into three by the nervures, followed by a second, oval, separated from the first by a wide space, and out of the line in the direction of the inner angle; after this the band is uninterrupted except by the nervures, and diminishes to a point a little within the abdominal margin, on the arc of primaries a narrow, transverse, ferruginous band, and another in the cell, each edged on either side by a black wavy line; a similar line mid-way between these bands; the cell and costa next base have a dull green tinge; at anal angle a black spot within a fulvous lunule; fringe brown, white in the emarginations.

Under side pale brown, with a bronze lustre on secondaries; primaries have a broad hind margin, crenated next the inner angle, with a faint, pale blue line running through it and edged anteriorly by a narrow, pale blue band; the yellow spot as above, but paler; below this and between the marginal and white bands, smoky black; the white band as above but a little enlarged; the bars in the cell larger and fulvous; inner margin next base greyish; hind margin of secondaries narrower than that of primaries, wholly crenated, with a pale blue line running through it and bordered anteriorly by a broad, pale blue band; the white band is edged without, and near its point suffused with light purple; inside the band to the base, are alternate, irregular, transverse bands of purple and lustrous yellow brown; abdominal margin pale blue; the nervures much bordered by purple or blue scales; body above olive brown; beneath, bluish white; antennæ and club dark brown.

Female scarcely differs from the male.

California, from Dr. H. Behr.

Synopsis of the North American Forms of the COLYMBIDÆ and PODICIPIDÆ.

BY ELLIOTT COUES.*

Family COLYMBIDÆ.

Char. Feathers of forehead reaching to the nostrils. Nostrils narrow and linear; their upper edge with a dependent lobe. Lores densely feathered. Tertials short and stiff. Tail fully developed. Tarsus and toes covered with small, regular, polygonal, reticulated plates. Tibiæ feathered on the joint. Toes fully webbed. Claws strong, narrow, oblong, very convex superiorly. Posterior edge of tarsus smooth, formed by a single row of very convex overlapping scales. Lobe of hind toe moderate. Size large; general form stout and strong; body robust; neck short and thick, without crests or ruffs; the back spotted.

Genus COLYMBUS Linnæus.

Colymbus, Linn. 1735, et auct. nec Ill. 1811; nec Pallas, 1811; nec Briss. 1764.
? *Cepphus*, Mœhring, 1752, secundum G. R. Gray.

Cepphus, Pallas, 1811, partim.

Mergus, Brisson, 1764, fide G. R. Gray; nec auct.

* The great accession of new material in the Museum of the Smithsonian Institution has furnished the means of making some additions and corrections to the last account of the Loons and Grebes of North America—that by Mr. Lawrence in the General Report. The writer having lately been occupied, in connection with Dr. Geo. Suckley, U. S. A., in the preparation of a Government Report, took the opportunity to institute a thorough revision of the two families. The results of that investigation will be found in full in the Report alluded to; but as it may be some time before its publication, it has been thought advisable to issue in advance this brief synopsis. Particular attention has been paid to the characters of the families and subfamilies, and to the arrangement of the species under their appropriate genera.

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Urinator, Cuvier, 1799-1800, fide G. R. Gray.

Eudytes, Illiger, 1811; (*Eudites*, Kaup, 1829.)

1. *COLYMBUS TORQUATUS* Brünnich.

C. torquatus, Brünn. 1764; *C. glacialis*, Linn. 1766, auctor. pleriq; ad.—

C. immer, Brünn. 1764; Linn. 1766; Gmel. 1788; Lath. 1790; juv.—

Cephus torquatus, Pall. 1811, ad.; *C. imber*, Pall. 1811, juv.; *Eudytes glacialis*, Illiger, 1811; *Eudites glac.* Kaup. 1829.

2. *COLYMBUS ADAMSII* G. R. Gray.

Colymbus Adamsii, Gray, Proc. Zool. Soc. Lond. 1859, 167.

Sp. Ch. Form and general appearance that of *C. torquatus*, but larger, with the bill disproportionately larger, and differently shaped.

Bill very large and strong, about equal in length to the head, longer than the tarsus, greatly compressed, the tip very acute, not decurved. Culmen very slightly, scarcely appreciably, convex. Commissure perfectly straight. Gonys straight, or very nearly so, to the angle, which is prominent, well defined; and straight, or even a little concave, to the tip. Feathers of forehead extending beyond the middle of the nostrils. Groove along the symphysis of the lower jaw extending but little beyond the angle.

Adult.—Bill light yellowish, growing dusky at the base. Head and neck all round deep steel blue, with purplish and violet reflections, and glossed on the back of the neck with deep green. Gular patch of white streaks very small, less than in *torquatus*, but the individual streaks larger, as are also those on the side of the neck. Upper parts generally as in *torquatus*, but the spots considerably larger, and on the scapulars and tertials rectangular, instead of nearly square, being much longer than broad. Otherwise like *torquatus*.

Plumage of the young unknown.

Bill above 3.70; along gape 5.25; height of nostril anteriorly 1.10; width, .50; tarsus 3.50; outer toe 4.65 inches. "Irides light reddish-brown, legs and feet olivaceous."

Habitat. Russian America (Gray). Arctic America (Ross, Kennicott).

Table of Distinctive Characters.

C. torquatus. Bill 2.75 inches, not longer than the tarsus; moderately compressed; black; the tip only sometimes yellowish. Culmen very convex. Commissure decurved. Gonys regularly convex throughout its whole length, the angle scarcely appreciable; the groove along symphysis extending nearly to tip. Feathers of the forehead falling short of the middle of the nostrils. Head and neck mostly deep glossy green. White spots of back moderate, scarcely longer than broad.

C. Adamsii. Bill 3.75; longer than the tarsus; exceedingly compressed; light yellow, except at base. Culmen very slightly convex. Commissure straight. Gonys straight, or nearly so, to the angle, straight, or even a little concave to the tip, the angle prominent, well defined. Groove along symphysis very short. Feathers of forehead extending beyond the middle of the nostrils. Head and neck mostly deep steel blue. White spots of back large, much longer than broad.

There cannot be, I think, the slightest doubt of the specific distinction of the present species and the *C. torquatus*. The difference in the size, shape, and color of the bill alone would separate the two, were there no other characters involved. It is every way a much larger bird. The species is, so far as we are aware, now for the first time presented in an American work. The original description, by Gray (as above), is very brief, but the distinctive characters of the species are so concisely stated that we have no difficulty in identifying the large series before us with the description. The Loon mentioned by Audubon, as having "the point of the bill recurved, and of a fine yellow tint," was very possibly an individual of this species. The type of 1862.]

the species is from Russian America. The large series which the Smithsonian possesses, were collected in the vicinity of Great Slave Lake and McKenzie's River, by R. Kennicott and B. R. Ross, Esqrs. It has not been obtained from the Atlantic coast.

3. *COLYMBUS ARCTICUS* Linnæus.

C. arcticus, Linn. 1735, et auct. *Cephus arct.* Pall. 1811. *Eudytes arct.* Illig. 1811.

4. *COLYMBUS PACIFICUS* Lawrence.

C. pacificus, Lawr. Gen. Rep. Birds, 1858, 889.

Sp. Ch. Generally similar to *C. arcticus*, but every way smaller; the wing from an inch to two inches shorter, the legs and feet proportionately shorter, and the bill smaller, shorter, weaker, usually with a less decurved culmen, and more acute tip. Colors precisely as in *C. arcticus*. "Length 25 inches; wing $11\frac{1}{4}$; bill 2-12; tarsus 2-75."

Habitat. Northern North America. Pacific coast.

The types of Mr. Lawrence's *C. pacificus* are young birds, and their relationship can only be determined by their size and form. A comparison of these types with an extensive series of skins of the adult bird, from the interior of Northern North America, has shown them to be beyond a doubt identical. The entire series differs from a fine adult European bird furnished for examination by the Copenhagen Museum, in those points which are given in the diagnosis. The difference is very marked indeed, and while all the birds in the North American series agree perfectly with each other, there is, at the same time, not the slightest gradation between them and the European bird. This would seem to indicate that the North American bird is distinct from the European; or, in other words, that "*Colymbus pacificus* Lawr." is the "*Colymbus arcticus ex America*." Upon this supposition it would be necessary to exclude the *C. arcticus* from our avi-fauna. There is in the collection, however, a specimen (from Puget Sound) which is fully as large as the European bird, with which it agrees in the minutest particulars, and is much larger and stouter every way than the rest of the series. I have, therefore, at present no other alternative than to admit the *C. pacificus* as distinct from the *arcticus*, in view of the differences constantly observable, and at the same time to retain the latter as an inhabitant of North America. I think it probable, however, that if the true *arcticus* is really found in North America, it is rather as an infrequent visitor than as a permanent resident. I do not regard the question as yet definitely settled, especially as the single European skin examined may have been an unusually large specimen. Further investigation will be necessary to definitely settle the point.

Should the *pacificus* prove to be really distinct from the *arcticus*, it would be another example of a peculiar law which prevails extensively throughout the *Colymbide* and *Podicipide*. This is, that nearly all the species have, so to speak, their analogues, agreeing in colors and general appearance, but differing in size, and in the size, shape, and stoutness of the bill. Instances are seen in the cases of *Colymbus Adamsii* and *torquatus*; *Podiceps griseigena* and *Holbølli*; *P. cornutus* and *?arcticus*; *Aichmophorus occidentalis* and *Clarkii*; *Podilymbus podiceps* and *brevirostris*, etc. This law seems capable of very extensive application.

5. *COLYMBUS SEPTENTRIONALIS* Linnæus.

Colymbus septentrionalis, Linn. 1766, et auct. *C. lumme*, Brünn. 1764, ad. *C. stellatus*, Brünn. 1764; Gmel. 1788; Lath. 1790; juv. *C. striatus*, Gmel. 1788; Lath. 1790; juv. *C. borealis*, Brünn. 1764; Gmel. 1788; Lath. 1790. *Cephus septentrionalis*, Pall. 1811. *Cephus stellatus*, Pall. 1811.

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Family PODICIPIDÆ.

Char. Feathers of forehead not reaching to the nostrils. Nostrils linear, oblong, sometimes quite broadly oval, without dependent lobe. Lores naked. Tertiaries long, reaching to the tip of the primaries in the closed wings. Tail rudimentary. Tarsus and toes covered with regular, long, narrow, transverse scutellæ. Toes lobed, connected at base by a membrane. Tibiæ feathered to the joint. Claws weak, broad, short, flat. Posterior edge of tarsus serrated, formed by a double row of small, pointed scales. Lobe of hind toe large. Size moderate, or very small; general form rather slender; body depressed; neck long; crests or ruffs usually present; the back never spotted.

The preceding diagnosis expresses very briefly the more prominent characters of a group of birds composing the subfamily *Podicipinæ* of modern authors. It corresponds with the *Colymbi pedibus palmatis* and *pedibus lobatis* of Gmelin, nearly with the *Cepphi* and *Colymbi* of Pallas, and with the genera *Colymbus* and *Podiceps* of Latham. Although related to the *Colymbidæ* in most points of structure and habits, they nevertheless differ in so many and so essential characters, that a single family cannot, without great latitude of definition, contain the two groups. We have, therefore, restricted the *Colymbidæ* to the *Colymbinæ* of authors, and raised the *Podicipinæ* to the rank of a distinct family.

Two subfamilies are represented in North America.

Subfamily PODICIPINÆ.

Char. Bill moderately stout, or very slender. Commissure not abruptly decurved at the end. Nostrils linear. Bare loreal space narrow and linear. Feathers of the head with their shafts normal. Tarsus at least three-fourths the middle toe; generally but little, if any, shorter. Toes connected at base for a moderate distance, the lobe of the hind toe broad. Usually (always?) with more or less conspicuous crests and ruffs.

Genus I. ÆCHMOPHORUS COUES. N. G.

Gen. Char. Bill very long, exceeding the head, straight or very slightly recurved, slender, attenuated towards the tip, which is very acute. Culmen straight or slightly concave. Commissure about straight. Gonys convex throughout its whole length, the angle scarcely appreciable. Nasal groove long, shallow, and narrow. Bare loreal space very narrow. Wings rather long, pointed, the outer primaries much attenuated. Legs very long. Tarsus as long as the middle toe and claw, exceeding the bill, excessively compressed. Outer lateral toe much longer than the middle. Lobes united at base for a very short distance. Size large; body slender; neck very long. Head with moderate crests, but without decided ruffs?

Type. *Podiceps occidentalis*, Lawr.

1. ÆCHMOPHORUS OCCIDENTALIS (Lawr.)

Podiceps occidentalis, Lawr. 1858.

Char. Length about 29 inches; wing 8.25; bill or tarsus 3.00. Bill equal to tarsus, straight, dark colored, except terminally and along the cutting edges. Gonys straight from base to angle, and nearly so from angle to tip. Feathers between eye and nostril grayish ash.

Habitat. Pacific coast of North America.

2. ÆCHMOPHORUS CLARKII (Lawr.)

Podiceps Clarkii, Lawr. 1858.

Char. Much smaller than *A. occidentalis*. Length 22 inches; wing 7; bill 2.25; tarsus 2.75; bill rather shorter than tarsus, exceedingly acute, slightly recurved; the gonys regularly much curved from base to tip, the angle scarcely apparent. Feathers between eye and nostril white.

Habitat. Pacific coast of North America.

1862.]

Genus II. PODICEPS Latham.

Colymbus, Briss. 1760, nec. Linn. et auct. Ill. 1811; Pall. 1811.

Podiceps, Lath. 1790; (typus *Col. cristatus*, Linn.) nec Kaup. 1829.

Pedetaithya, Kaup. 1829; typus *Col. griseigena*, Budd. 1783.)

Lopharthya, Kaup. 1829; (typus *Col. cristatus*, Linn. *Podiceps*, Lath. 1790.)

Dytes, Kaup. 1829; (typus *Col. cornutus*, Gmel.)

Proctopus, Kaup. 1829; (typus *Col. auritus*.)

Otodytes, Reichenbach, 1853; (typus idem.)

Gen. Char. Bill moderately stout; usually more or less compressed; as long as, or rather shorter than, the head; not equalling the tarsus. Culmen convex, occasionally nearly or quite straight. Commissure about straight. Tarsus shorter than the middle toe and claw. Outer lateral but little, if any, longer than the middle toe. Body depressed, moderately full; head always with more or less conspicuous crests and ruffs.

Although the characters of the genus are drawn so as to exclude both the foregoing and succeeding genus, the North American species comprised in it, are sufficiently dissimilar in form to have caused the instituting of several subgenera. These may be characterized and arranged as follows:—

A. Tarsus equal to the middle toe without the claw.

I. Bill equal to the head, four-fifths the tarsus. Bill much compressed, lateral outlines a little concave. Crests and ruffs very long and conspicuous..... *Podiceps*, Lath.

II. Bill much shorter than the head, but little more than half the tarsus.

1. Bill compressed, higher than broad at the nostrils; crests and ruffs, especially the latter, very long and full..... *Dytes*, Kaup.

2. Bill depressed, broader than high at the nostrils; crests and ruffs more moderate..... *Proctopus*, Kaup.

B. Tarsus about four-fifths the middle toe and claw.

III. Bill variable in length, always quite stout; outer lateral but little longer than the middle toe; crests and ruffs rather short..... *Pedetaithya*, Kaup.

1. PODICEPS CRISTATUS Latham.

Colymbus cristatus, Linn. 1766; Pall. 1811; Ill. 1811. *C. urinator*, Linn. 1766, juv. *Podiceps crist.* Lath. 1790, et auct.

Habitat. Europa; Amer. Sept.

2. PODICEPS COOPERI Lawrence.

Sp. Char. Bill large and strong, as long as the head, very stout at the base, the tip very acute and considerably decurved. Upper mandible with the culmen very slightly concave on the basal half, the terminal portion regularly convex. Commissure irregularly sinuate to the nostrils, then regularly decurved, the radius of curvature decreasing towards the tip. Lower mandible without a groove along the symphysis of the rami beyond the angle, the tip decurved and very acute. Lower outline concave, both anterior and posterior to the angle, which is prominent and marked; the concavity is very decided in the former. First and second primaries longest, third but little shorter. Tarsi and toes as in *P. cristatus*.

Young. Upper mandible dusky, except the tip and extreme base, which are yellowish, as is also the lower mandible, except a central dusky greenish space. No white space between eye and nostril. Slight indications of a crest, but none at all of a ruff. Crown, and median dorsal line of neck, deep blackish brown, darkest on the former. Upper parts brownish black, darkest on the scapulars and lower part of the back, all the feathers, especially an-

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teriorly, edged with grayish. Primaries rather light chocolate brown, their shafts and tips black. Secondaries white, their inner vanes brown towards their extreme tips. Wing coverts wholly chocolate brown.

Dimensions. Bill above 2.40, along gape 3.10, height at nostril .55, from angle of gonys to tip 1 inch; wing 8.80; tarsus 2.40; middle toe, 3.10.

Habitat. Shoalwater Bay, W. T.

A species admitted with some doubt, but probably distinct from the preceding. It must be obtained in full plumage before the question of its relationship can be definitely settled. We do not consider it by any means certain that it will possess the conspicuous ruffs of *P. cristatus*. In that event, it would more probably fall in some other subgenus.

3. *PODICEPS (DYTES) CORNUTUS* (Gmelin.)

Colymbus cornutus, Gmel., 1788; Pall., 1811; ad. *C. obscurus*, Gmel., 1788, et *C. caspicus*, Gmel., 1788; juv. *C. nigricans*, Scopoli, fide Lawr. *Podiceps cornutus*, Lath., 1790, et auct. ? *P. arcticus*, Boie.

Habitat. Europ. Amer. Sept.

4. *PODICEPS (PROCTOPUS) CALIFORNICUS* Heermann.

Podiceps auritus ex America; e. g. Aud. B. Am., 1844, vii. 322. Lawr. Gen. Rep. 1858, synon. excl. Nec *Colymbus aur.* Linn.; nec script. Europ. *P. Californicus*, Heermann, 1854; Lawr., 1858.

Char. Generally similar to *P. auritus* of Europe; all the primaries chocolate brown throughout their whole extent, with a more or less notable amount of dull reddish externally. Secondaries white, the two outer ones dusky along their centres for their whole length, and the bases and shafts of all of the same color.

Habitat. Western and Northern North America; California; Great Slave Lake.

In 1854, a *Podiceps californicus* was characterized, as above, based upon an immature or winter specimen. Examination of the type, and quite a series of additional specimens, has shown that it is merely the American form of *P. auritus*. The name would, therefore, become a synonym were it not for the fact that, in all probability, the American and European birds are specifically distinct. The differences are those given in the diagnosis. In the American Eared Grebe, all the primaries are throughout their whole extent dark chocolate brown, with a more or less notable amount of dull reddish in the adult. The two first secondaries are of the color of its primaries, and bordered with white; and the basal portions and shafts of all, for the greater part of their length, are of the same chocolate brown. In all the specimens of the European type examined, the characters of the wing are very different. The four inner primaries are wholly pure white; the next is white with a sprinkling of brown on the outer web; the next is white, its outer vane brown; and all the others have more or less white at their bases and on the inner webs. All the secondaries, except the three innermost are entirely pure white, and their shafts are white to the very base. The three innermost have a dusky spot near the end of the outer web. These differences, so far as we can discover, are constant; and if so, quite sufficient to separate the two.

Although "*californicus*" was not so characterized as to show any tangible distinctive features from the *auritus*, we prefer to adopt it, as the necessity for a new name will thereby be obviated.

5. *PODICEPS (PEDETAITHYA) HOLBÖLLI* Reinhardt.

Pod. rubricollis, Audub. et al. script. Amer.; nec Lath., 1790, et auct. Europ. *P. griseigena*, Lawr., 1858, excl. synon. Nec *Colymbus griseigena*, Bodd. *P. Holbölli*, Reinhardt, 1853.

Sp. Char. Generally similar to *P. griseigena*, but larger, with the bill disproportionately longer, stouter, and differently colored. Bill about equal to 1862.]

the head, shorter than the tarsus. Length about 19 inches, wing 7·60. Bill above 1·90, along gape 2·40, height at nostril ·55. Tarsus 2·10; middle toe and claw 2·65.

Habitat. North America, generally.

The present species has by most authors been considered identical with the *P. griseigena* Bodd. (*rubricollis* of Latham,) of Europe. The differences, however, as pointed out by Reinhardt, are quite tangible, and so constant as to render it very probable that they are of specific value. In the European bird the bill measures 1·50 along the culmen, 2·00 along the gape, and ·50 in height at the nostrils; the wing less than 7 inches. (See diagnosis for comparison). In color, too, the bills differ. In *P. griseigena* the extreme base of the under mandible only is yellow, the color extending a little on the cutting edge of the upper mandible at base. In *Holböllli* nearly the whole of the under mandible, and the cutting edge of the upper, are yellow.

Genus III. SYLBEOCYCLUS Bon.

Podiceps, Kaup, 1829, nec Lath.

Sylbeocyclus, Bonaparte, 1832. (Typus *Pod. minor*, fide G. R. Gray.)

Tachybaptus, Reichenbach, 1851. (Typus idem.)

Gen. Char. Bill very short, much less than the head, scarcely more than half the tarsus; very stout, little compressed, the tip obtuse; lateral outlines about straight; culmen a little concave at the nostrils, convex throughout the rest of its length; gonys straight to the angle, and from angle to tip; the former well defined. Wings short; attenuation of primaries considerable; abrupt on the inner web. Tarsus stout for this family, much abbreviated, scarcely more than three-fourths the middle toe and claw. Outer lateral toe about equal to the middle. Size small; body full; neck short; without decided crests or ruffs.

1. SYLBEOCYCLUS DOMINICUS (Linn.)

Podiceps dominicus, Linn., 1766. *Sylbeocyclus dominicus*, —?

Sp. Char. Adult.—Without decided crests, but indications of them in the length and fullness of the feathers of the parts. Crown and occiput deep glossy steel blue. Sides of head, and neck all round dark ashy gray, deepest behind, where it is tinged with bluish. Chin variegated with ashy and white. Upper parts generally brownish black, with glossy greenish reflections. Primaries chocolate brown, the greater portions of the inner vanes of all, the whole of the four or five inner, except just at tip, together with the secondaries, pure white. Under parts silky white, thickly mottled with brownish dusky; the abdomen uniform dusky gray. Upper mandible dusky, the lower mostly yellowish.

Dimensions. Length 9·50; wing 3·60; bill above ·70; along gape 1·00; tarsus 1·25; middle toe 1·75.

Habitat. Central America; Mexico; Antillean Is.; Gulf of California (Gambel); Rio Grande (eggs in Smiths. Coll.).

[NOTE.—*Sylbeocyclus minor*, the type of the genus, is given by Nuttall as an inhabitant of North America; but its existence in this country is very doubtful.]

Subfamily PODILYMBINÆ.

Char. Bill exceedingly stout. Commissure abruptly decurved at the end. Nostrils broadly oval. Bare loreal space broad. Feathers of the forehead with their shafts prolonged into stiff bristles. Tarsus not three-fourths the middle toe. Toes connected at base for a considerable distance; the lobe of the hind toe moderate. Without decided crests or ruffs.

Genus IV. PODILYMBUS Lesson.

Podilymbus, Lesson, 1831. (Typus *Colymbus podiceps*, Linn.)

Hydroka, Nuttall, 1834.

Dasyptilus, Swainson, 1837, fide G. R. Gray.

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Gen. Char. Bill shorter than the head, compressed, exceedingly stout, obtuse at the end; culmen straight to the nostrils, then very convex to the decurved and acute tip of the upper mandible. Commissure slightly sinuate at the base, straight to near the tip, where it is suddenly deflected. Gonys regularly convex, the angle scarcely appreciable. Upper mandible covered with soft skin from the base to the nostrils, between which are two fossæ, the anterior shallow and oblong, the posterior triangular and deep, opening into the bare loral space; the two separated by an oblique ridge. Nostrils situated near the extremity of the anterior fossa. Outer three or four primaries abruptly attenuated near the end. Tarsus much abbreviated, comparatively stout, about three-fourths the middle toe and claw. Middle and outer toe nearly equal. Lobes of toes broad, connected at base for a greater distance than in other genera.

1. *PODILYMBUS PODICEPS* (Linn.)

Colymbus podiceps, Linn., 1766. *Podilymbus pod.* Lawr., 1858. *Podil. lineatus*, Heerm., 1854. *Colymbus ludovicianus*, Gmel., 1788. *Podiceps ludov.* Lath., 1790. *Pod. carolinensis*, Lath., 1790. *Sylbeocyclus carol.*, Bon., 1838.

Habitat. Continent of North America.

On a new genus of Fishes allied to *AULORHYNCHUS* and on the affinities of the Family *AULORHYNCHOIDÆ*, to which it belongs.

BY THEODORE GILL.

In the Proceedings of the Academy of Natural Sciences for July, 1861, (p. 168), I have described a new type of fishes, and referred it to the family of Aulostomatoids, with which it agreed in the elongation of the body, form of the head, opposition of the dorsal and anal fins and the development before the former of free spines as well as the presence of four branchiostegal rays. In the MSS. remarks on the relations of the genus, intended for the Report on the Fishes collected by the Northwestern Boundary Commission, I had commented on the relations of the new form and its affinity to the Gasterostoid genus *Spinachia*. I have now the pleasure of making known a genus which is still more closely related to *Spinachia*, and which it would not be even very improper to refer to the family of Gasterosteoids. It has, however, the four branchiostegal rays of *Aulostoma* and *Solenostomus*, as well as the more elongated tube. But I am disposed to believe that the four subfamilies* of the Aulostomatoid fishes proposed in my former paper, are true families, and that *Aulorhynchus*, and especially the new genus are at least as closely related to the Gasterosteoids as to the Aulostomatoids. They agree with the former family in

1st. General form. 2d. Development of the dorsal and anal fins and the antecedent spines. 3d. Development of the forearm (ulnar and radial bones) and of the pectoral fin. 4th. Position of the ventral fins. 5th. Development of the caudal fin.

The affinity of the two families is further shown by the possession of other characters in common by the Spinachianæ and *Aulichthys*.

* The genus *Siphonognathus* of Richardson appears to be the type of a peculiar family (Siphognathoidæ), more nearly related to the Labroids than to the typical Aulostomatous fishes, although having the four branchiostegal rays, tubular snout, &c. of the latter. Dr. Gunther has first perceived its affinities, but appears to be wrong in referring it to the same family with the other Labroids.